```
L61          85 L52 AND BOVINE

=> l61 and py<2000
L62          16 FILE AGRICOLA
L63          20 FILE BIOTECHNO
'2000' NOT A VALID FIELD CODE
L64           0 FILE CONFSCI
L65           0 FILE HEALSAFE
L66           0 FILE IMSDRUGCONF
L67          10 FILE LIFESCI
'2000' NOT A VALID FIELD CODE
L68           0 FILE MEDICONF

<------User Break------>

SEARCH ENDED BY USER

=> file .meeting
'EVENTLINE' IS NOT A VALID FILE NAME
Enter "HELP FILE NAMES" at an arrow prompt (=>) for a list of files
that are available.  If you have requested multiple files, you can
specify a corrected file name or you can enter "IGNORE" to continue
accessing the remaining file names entered.
ENTER A FILE NAME OR (IGNORE):ignore
COST IN U.S. DOLLARS                                SINCE FILE      TOTAL
                                                         ENTRY    SESSION
FULL ESTIMATED COST                                      11.52      22.58

FILE 'AGRICOLA' ENTERED AT 10:01:09 ON 11 MAY 2004

FILE 'BIOTECHNO' ENTERED AT 10:01:09 ON 11 MAY 2004
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FILE 'PASCAL' ENTERED AT 10:01:09 ON 11 MAY 2004
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=> (PAG or (pregnancy associated glycoprotein))(P)bovine(P)(pregnancy or pregnant)
L69          21 FILE AGRICOLA
PROXIMITY OPERATOR LEVEL NOT CONSISTENT WITH
FIELD CODE - 'AND' OPERATOR ASSUMED 'OPROTEIN))(P)BOVINE'
PROXIMITY OPERATOR LEVEL NOT CONSISTENT WITH
FIELD CODE - 'AND' OPERATOR ASSUMED 'BOVINE(P)(PREGNANCY'
L70          31 FILE BIOTECHNO
L71           1 FILE CONFSCI
```

```
L72           0 FILE HEALSAFE
L73           0 FILE IMSDRUGCONF
L74          14 FILE LIFESCI
PROXIMITY OPERATOR LEVEL NOT CONSISTENT WITH
FIELD CODE - 'AND' OPERATOR ASSUMED 'OPROTEIN))(P)BOVINE'
PROXIMITY OPERATOR LEVEL NOT CONSISTENT WITH
FIELD CODE - 'AND' OPERATOR ASSUMED 'BOVINE(P)(PREGNANCY'
L75           0 FILE MEDICONF
PROXIMITY OPERATOR LEVEL NOT CONSISTENT WITH
FIELD CODE - 'AND' OPERATOR ASSUMED 'OPROTEIN))(P)BOVINE'
PROXIMITY OPERATOR LEVEL NOT CONSISTENT WITH
FIELD CODE - 'AND' OPERATOR ASSUMED 'BOVINE(P)(PREGNANCY'
L76          17 FILE PASCAL

TOTAL FOR ALL FILES
L77          84 (PAG OR (PREGNANCY ASSOCIATED GLYCOPROTEIN))(P) BOVINE(P)(PREGNA
                NCY OR PREGNANT)

=> dup rem
ENTER L# LIST OR (END):l77
DUPLICATE IS NOT AVAILABLE IN 'IMSDRUGCONF, MEDICONF'.
ANSWERS FROM THESE FILES WILL BE CONSIDERED UNIQUE
PROCESSING COMPLETED FOR L77
L78           38 DUP REM L77 (46 DUPLICATES REMOVED)

=> d l78 ibib abs total

L78   ANSWER 1 OF 38  BIOTECHNO  COPYRIGHT 2004 Elsevier Science B.V. on STN
ACCESSION NUMBER:         2003:36345634   BIOTECHNO
TITLE:                    Early pregnancy diagnosis in sheep by
                          progesterone and pregnancy-
                          associated glycoprotein tests
AUTHOR:                   Karen A.; Beckers J.-F.; Sulon J.; Melo De Sousa N.;
                          Szabados K.; Reczigel J.; Szenci O.
CORPORATE SOURCE:         A. Karen, Clinic for Large Animals, Faculty of
                          Veterinary Science, H-2225 Ullo-Dora Major, Hungary.
                          E-mail: alykaren@hotmail.com
SOURCE:                   Theriogenology, (2003), 59/9 (1941-1948), 32
                          reference(s)
                          CODEN: THGNBO  ISSN: 0093-691X
DOCUMENT TYPE:            Journal; Article
COUNTRY:                  United States
LANGUAGE:                 English
SUMMARY LANGUAGE:         English
AN    2003:36345634   BIOTECHNO
AB    The aim of this study was to compare the accuracy of the progesterone
      (P4) and pregnancy associated glycoprotein
      (PAG) tests for determination of early pregnancy in
      sheep. Estrus was synchronized in 182 Awassi x Merino ewes and blood
      samples were collected at Days 0 (day of the insemination), 18, 22, 29,
      36, and 50 after artificial insemination (AI). Plasma P4 concentrations
      at Days 0 and 18 were determined by double antibody radioimmunoassay,
      while PAG concentrations at Days 22, 29, 36 and 50 were
      determined by a heterologous, double-antibody radioimmunoassay (RIA)
      using the bovine PAG 67 kDa subunit as tracer and
      standard and rabbit antiserum raised against a mixture of caprine 55 and
      59 kDa PAG subunits as the first antibody. The discriminatory
      value for diagnosis of pregnancy by the P4 and the PAG
      -RIA tests was >=1 ng/ml. Based on lambing data, the accuracy for
      diagnosing pregnant (sensitivity) and non-pregnant
      ewes (specificity) and predictivity of both tests were calculated. The
      sensitivity, specificity, positive and negative predictive values for P4
      and PAG tests were 100, 95.4, 81.6, and 100% at Day 18 (P4) and
      93.5, 100, 100 and 98.7% at Day 22 (PAG), respectively. For
```

diagnosis of non-**pregnant** ewes the **PAG** test had significantly higher specificity than the P4 test ($P < 0.05$). It is concluded that ovine **pregnancy** can be reliably diagnosed at Day 22 after AI by using a heterologous radioimmunoassay of **PAG**.

L78 ANSWER 2 OF 38 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved. (2004) on STN DUPLICATE 1

ACCESSION NUMBER: 2003:42934 AGRICOLA
DOCUMENT NUMBER: IND23332439
TITLE: Double radical immunodiffusion as a tool to identify pregnancy-associated glycoproteins in ruminant and nonruminant placentae.
AUTHOR(S): El Amiri, B.; Sousa, N.M. de.; Mecif, K.; Desbuleux, H.; Banga-Mboko, H.; Beckers, J.F.
AVAILABILITY: DNAL (QP251.A1T5)
SOURCE: Theriogenology, Mar 2003. Vol. 59, No. 5/6. p. 1291-1301
Publisher: New York, N.Y. : Elsevier Science Inc.
CODEN: THGNBO; ISSN: 0093-691X
NOTE: Includes references
PUB. COUNTRY: New York (State); United States
DOCUMENT TYPE: Article
FILE SEGMENT: U.S. Imprints not USDA, Experiment or Extension
LANGUAGE: English

AB **Pregnancy-associated glycoproteins** (**PAGs**) are antigens synthesized in the superficial layers of the ruminant trophoblast. Initially, they were identified either as proteins released into the maternal bloodstream (where they have applications in **pregnancy** diagnosis) (PAG1) or as molecules binding to the LH receptor (PAG2). In this study, double radial immunodiffusion was used to test the ability of antisera raised against different **PAG** molecules (**bovine**, ovine and caprine) to react with placental extracts from nonruminants (rabbit, cat, mouse, pig, and wild pig) and ruminants (cow, ewe, and goat). Placental extracts from all nonruminants tested except rabbit reacted with anti **bovine** PAG2 (anti-boPAG2). Extracts of ruminant placentas reacted with different antisera, confirming the expression of various **PAG** molecules. According to the time at which the placentas were collected (early or middle **pregnancy**), the reaction differed as regards the thickness, position, and number of precipitation lines, suggesting that **PAG** expression varies as **pregnancy** progresses. Bos indicus and Bos taurus placental extracts exhibited different reactions with anti-boPAG2: a single precipitation line in the former case and two lines in the latter. This suggests differential expression of boPAG2 related glycoproteins in these two subspecies.

L78 ANSWER 3 OF 38 BIOTECHNO

ACCESSION NUMBER: 2003:36071271 BIOTECHNO
TITLE: **Pregnancy** in rabbits actively immunized against **bovine pregnancy-associated glycoprotein** 1 [5]
AUTHOR: Banga-Mboko H.; Halloy D.; Perenyi Z.; El Amiri B.; De Sousa N.M.; Beckers J.F.
CORPORATE SOURCE: Dr. J.F. Beckers, Dept. of Physiology of Reproduction, Faculty of Veterinary Medicine, University of Leige, 20 Bd de Colonster, 4000 Sart Tilman, Belgium. E-mail: jfbeckers@ulg.ac.be
SOURCE: Fertility and Sterility, (01 JAN 2003), 79/1 (226-227), 6 reference(s)
CODEN: FESTAS ISSN: 0015-0282
PUBLISHER ITEM IDENT.: S0015028202045430

DOCUMENT TYPE: Journal; Letter
COUNTRY: United States
LANGUAGE: English
AN 2003:36071271 BIOTECHNO

L78 ANSWER 4 OF 38 BIOTECHNO COPYRIGHT 2004 Elsevier Science B.V. on STN
DUPLICATE
ACCESSION NUMBER: 2003:36068408 BIOTECHNO
TITLE: Isolation and partial characterization of three **pregnancy-associated glycoproteins** from the ewe placenta
AUTHOR: El Amiri B.; Remy B.; Sousa M.N.; Joris B.; Ottiers N.G.; Perenyi Z.; Mboko H.B.; Beckers J.-F.
CORPORATE SOURCE: J.-F. Beckers, Physiology of Reproduction, Faculty of Veterinary Medicine, University of Liege, Bd de Colonster no 20, B-4000, Sart-Tilman, Liege, Belgium. E-mail: jfbeckers@ulg.ac.be
SOURCE: Molecular Reproduction and Development, (01 FEB 2003), 64/2 (199-206), 37 reference(s)
CODEN: MREDEE ISSN: 1040-452X
DOCUMENT TYPE: Journal; Article
COUNTRY: United States
LANGUAGE: English
SUMMARY LANGUAGE: English
AN 2003:36068408 BIOTECHNO
AB **Pregnancy-associated glycoproteins** (**PAGs**) are synthesized in the outer epithelial layer of the placenta in artiodactyls. In this work, three novel ovine **PAGs** were isolated from late-**pregnancy** fetal cotyledons and characterized biochemically. The isolation procedure included acid and ammonium sulfate precipitations and anion and cation exchange chromatographies. The isolated **PAGs** have different NH2-terminal amino acid sequences (RGSXLTILPLRNMRDIVY, ISRVSXLTIHPLRNIMDML, and RGSNLTIHPLRNIRD) and apparent molecular masses (55, 57, and 59 kDa). Each shows several isoforms with different pI values. The three proteins share high sequence identity with each other and with other ovine, **bovine**, and caprine **PAGs**. They have not been described previously. The ovPAG-59 sequence differs from the previously identified ovPAG-4 sequence (determined by DNA cloning and sequencing) at only one position among the 15 N-terminal residues. The newly characterized ovPAGs and the procedure used to isolate them will be helpful in producing new antisera for investigating **PAG** secretion in **pregnant** ewes. .COPYRGT. 2003 Wiley-Liss, Inc.

L78 ANSWER 5 OF 38 BIOTECHNO COPYRIGHT 2004 Elsevier Science B.V. on STN
DUPLICATE
ACCESSION NUMBER: 2003:36373956 BIOTECHNO
TITLE: Characterization of gene expression profiles in early **bovine pregnancy** using a custom cDNA microarray
AUTHOR: Ishiwata H.; Katsuma S.; Kizaki K.; Patel O.V.; Nakano H.; Takahashi T.; Imai K.; Hirasawa A.; Shiojima S.; Ikawa H.; Suzuki Y.; Tsujimoto G.; Izaike Y.; Todoroki J.; Hashizume K.
CORPORATE SOURCE: K. Hashizume, Laboratory of Reproductive Biology, Department of Developmental Biology, Natl. Inst. of Agrobiol. Sciences, Ikenodai 2, Tsukubacity, Ibaraki 305-8602, Japan. E-mail: kazuha@affrc.go.jp
SOURCE: Molecular Reproduction and Development, (01 MAY 2003), 65/1 (9-18), 35 reference(s)
CODEN: MREDEE ISSN: 1040-452X
DOCUMENT TYPE: Journal; Article
COUNTRY: United States

LANGUAGE: English
SUMMARY LANGUAGE: English
AN 2003:36373956 BIOTECHNO
AB Gene expression analysis comparing nonpregnant with **pregnant bovine** uteri, including placenta, was performed with a custom cDNA microarray containing 1,933 independent genes. These genes were classified into six categories according to biological function, as follows: cell and tissue structural dynamics (108 genes), intercellular communication (221), intracellular metabolism (265), cell cycle and apoptosis (26), regulation of gene expression (113), expressed sequence tag (EST) and function unknown (617), and uncomplemented genes (583 clones). This array possessed **bovine** placental/endometrial specificity, as it included many **pregnancy**-specific molecules, such as **pregnancy-associated glycoprotein**-1 (**PAGs**), placental lactogen (PLs), and prolactin-related protein-1 (PRPs). A total of 77 genes were induced and 12 repressed in the placenta/endometrium. Our results point to a fundamental role for **bovine** placentalspecific genes such as **PAGs**, PLs, and PRPs, in implantation and placentogenesis, and document that cDNA microarray analysis from **bovine** placenta/ endometrium is possible and is a specific tool for monitoring genome-wide gene expression during the establishment and maintenance of **pregnancy** . .COPYRGT. 2003 Wiley-Liss, Inc.

L78 ANSWER 6 OF 38 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved. (2004) on STN
ACCESSION NUMBER: 2003:33637 AGRICOLA
DOCUMENT NUMBER: IND23321070
TITLE: Endocrine changes in late bovine pregnancy with special emphasis on fetal well-being.
AUTHOR(S): Kindahl, H.; Kornmatitsuk, B.; Konigsson, K.; Gustafsson, H.
AVAILABILITY: DNAL (QL868.D6)
SOURCE: Domestic animal endocrinology, July 2002. Vol. 23, No. 1/2. p. 321-328
Publisher: New York, N.Y. : Elsevier Science Inc.
CODEN: DANEEE; ISSN: 0739-7240
NOTE: In the special issue: Fourth International Conference on Farm Animal Endocrinology / edited by C. Tamanini; Includes review papers presented at a conference held October 7-10, 2001, Parma, Italy.
Includes references
PUB. COUNTRY: New York (State); United States
DOCUMENT TYPE: Article
FILE SEGMENT: U.S. Imprints not USDA, Experiment or Extension
LANGUAGE: English
AB During late **bovine pregnancy**, several hormones are involved to maintain and develop a successful result with a live calf. These hormones are e.g., progesterone, high levels during the whole **pregnancy** period, originating from the corpus luteum, maternal adrenals and placenta. Oestrone sulphate, oestrone in its conjugated form, shows elevated levels from about mid-**pregnancy** until the third stage of parturition (expelling of the fetal membranes). For the onset of normal parturition and the parturition process as such, a change from progesterone to oestrone synthesis is crucial. The increasing levels of oestrone are time-related to an increased synthesis of prostaglandin F(2alpha) (reflected as elevated levels of 15-ketodihydro-PGF(2alpha)) causing prepartal luteolysis and several hormones are then involved in the labour process such as prostaglandin F(2alpha), cortisol and oxytocin. Cortisol might also be an indicator of stressful events for the dam. Levels of **pregnancy associated glycoproteins** (**PAGs**), originating from the trophoblastic binucleate cells, are

increasing during the last 10 days prior to parturition. All the mentioned hormones have certain functions during **pregnancy**, more or less understood. However, could deviations from the expected profiles during late **bovine pregnancy** indicate impaired fetal well-being or be of importance for reproductive performance during the postpartum period? Abortions, stillbirths or dystocia are situations where endocrine profiles might predict the status of the calf. There are two possible approaches to study the endocrine changes in late **pregnancy**-to follow spontaneous cases of normal or impaired **pregnancies** or to experimentally disturb the gestation or induce parturition. We have in one study followed **pregnant** animals to depict reproductive disturbances, both animals with expected normal parturitions and animals where the sire of the calf has given rise to a high incidence of stillborn calves. The number of stillborn calves or dystocia has been small and so far it has not been possible to obtain a clear picture of the usefulness of endocrine parameters to follow fetal well being, but some of the hormonal parameters show a deviating profile. In a small group of animals with induced parturition (PGF(2alpha)), two out of three had parturition problems and one of these animals had a stillborn calf. All three animals had retained fetal membranes. It was possible to demonstrate a deviating endocrine profile in the cow having the stillborn calf in the sense of higher levels of progesterone, cortisol and 15-ketodihydro-PGF(2alpha) at the time of parturition. In both animals with dystocia the levels of oestrone sulphate after parturition were more sustained. Increasing and high levels of **PAGs** were only demonstrated in the animal with a normal parturition. These studies are ongoing, aiming at finding changes in endocrine profiles related to impaired **pregnancies**.

L78 ANSWER 7 OF 38 BIOTECHNO COPYRIGHT 2004 Elsevier Science B.V. on STN
DUPLICATE

ACCESSION NUMBER: 2002:35214656 BIOTECHNO
TITLE: Characterization of **pregnancy-associated glycoproteins** extracted from zebu (Bos indicus) placentas removed at different gestational periods
AUTHOR: Sousa N.M.; Remy B.; El Amiri B.; De Figueiredo J.R.; Banga-Mboko H.; Dias Goncalves P.B.; Beckers J.-F.
CORPORATE SOURCE: J.-F. Beckers, Physiology of Reproduction, Faculty of Veterinary Medicine, University of Liege, 4000 Liege, Belgium.
E-mail: jfbeckers@ulg.ac.be
SOURCE: Reproduction Nutrition Development, (2002), 42/3 (227-241), 29 reference(s)
CODEN: RNDEE5 ISSN: 0926-5287
DOCUMENT TYPE: Journal; Article
COUNTRY: France
LANGUAGE: English
SUMMARY LANGUAGE: English

AN 2002:35214656 BIOTECHNO

AB In the present work, two biochemical approaches were used to characterize **PAGs** isolated from Bos indicus fetal cotyledons removed at different gestational ages. The first procedure included acidic and ammonium sulfate precipitations, anion and cation exchange chromatographies and the second included pepstatin-agarose affinity chromatography. A **bovine PAG** radioimmunoassay was used to monitor the immunoreactivity throughout the isolation procedures. The most immunoreactive fractions issued from cation exchange and affinity chromatographies were analyzed by SDS-PAGE and Western blotting, before transfer to a polyvinylidene difluoride (PVDF) membrane for NH.sub.2-microsequence determination. Use SDS-PAGE and Western blotting, different isoforms of **PAG** with apparent molecular masses of 51 to 69 kDa and isoelectric points varying from 4.4 to 6.7 were identified in the placentas from different gestational ages. N-terminal

microsequencing (10 to 25 aa long) indicates the expression of one single terminal amino acid sequence in the Bos indicus placenta, which is 100% identical to the **bovine PAG**- 1.

L78 ANSWER 8 OF 38 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved. (2004) on STN DUPLICATE 5

ACCESSION NUMBER: 2002:42090 AGRICOLA
DOCUMENT NUMBER: IND23276733
TITLE: Comparison of the ability of three radioimmunoassay to detect **pregnancy-associated glycoproteins** in **bovine** plasma.
AUTHOR(S): Perenyi, Z.S.; Szenci, O.; Sulon, J.; Drion, P.V.; Beckers, J.F.
AVAILABILITY: DNAL (SF105.A1Z8)
SOURCE: Reproduction in domestic animals = Zuchthygiene, Apr 2002. Vol. 37, No. 2. p. 100-104
Publisher: Berlin : Blackwell Wissenschafts-Verlag GmbH.
CODEN: RDANEF; ISSN: 0936-6768
NOTE: Includes references
PUB. COUNTRY: Germany
DOCUMENT TYPE: Article
FILE SEGMENT: Non-U.S. Imprint other than FAO
LANGUAGE: English

L78 ANSWER 9 OF 38 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved. (2004) on STN DUPLICATE 6

ACCESSION NUMBER: 2002:18084 AGRICOLA
DOCUMENT NUMBER: IND23250542
TITLE: Assessment of a commercially available early conception factor (ECF) test for determining pregnancy status of dairy cattle.
AUTHOR(S): Cordoba, M.C.; Sartori, R.; Fricke, P.M.
AVAILABILITY: DNAL (44.8 J822)
SOURCE: Journal of dairy science, Aug 2001. Vol. 84, No. 8. p. 1884-1889
Publisher: Savoy, Ill. : American Dairy Science Association.
CODEN: JDSCAE; ISSN: 0022-0302
NOTE: Includes references
PUB. COUNTRY: Illinois; United States
DOCUMENT TYPE: Article
FILE SEGMENT: U.S. Imprints not USDA, Experiment or Extension
LANGUAGE: English

AB The Early Conception Factor (ECF) test is a commercially available qualitative assay that reportedly detects a **pregnancy-associated glycoprotein** present in **bovine** serum within 48 h after conception. One concern with previous assessments of this test is that animals with viable embryos early during **pregnancy** that subsequently undergo embryonic loss before **pregnancy** diagnosis increase the rate of false-positive results and bias the assessment. To preclude this possibility, noninseminated Holstein cows (n = 9) and heifers (n = 8) were evaluated as an unequivocal source of nonpregnant animals, and Holstein cows (n = 17) and heifers (n = 1) inseminated at estrus and in which at least one embryo of transferable quality was recovered at a nonsurgical flush 6 d after artificial insemination were evaluated as an unequivocal source of **pregnant** animals. Blood samples were collected from all animals 6 d after estrus, which was immediately before embryo collection in **pregnant** animals. Each serum sample was evaluated using two ECF test cassettes

(tests 1 and 2), and the result of each test cassette was interpreted by two independent readers (readers 1 and 2). Test sensitivity, specificity, positive predictive value, negative predictive value, and accuracy were 86, 4, 49, 23, and 46%, respectively. Although the observed agreement between readers (91% for test 1; 89% for test 2) and between tests for the same serum sample (94% for reader 1; 91% for reader 2) was high, the overall rates of false-positive and false-negative ECF test results were 96 and 14%, respectively. We conclude that the ECF test is an unreliable method for determining **pregnancy** status of dairy cattle on day 6 after estrus.

L78 ANSWER 10 OF 38 BIOTECHNO COPYRIGHT 2004 Elsevier Science B.V. on STN
DUPLICATE
ACCESSION NUMBER: 2001:32847122 BIOTECHNO
TITLE: Gene for porcine **pregnancy-associated glycoprotein** 2 (poPAG2): Its structural organization and analysis of its promoter
AUTHOR: Szafranska B.; Miura R.; Ghosh D.; Ezashi T.; Xie S.; Roberts R.M.; Green J.A.
CORPORATE SOURCE: J.A. Green, Department of Animal Sciences, University of Missouri, 158 Animal Science Research Center, Columbia, MO 65211, United States.
E-mail: GreenJo@missouri.edu
SOURCE: Molecular Reproduction and Development, (2001), 60/2 (137-146), 50 reference(s)
CODEN: MREDEE ISSN: 1040-452X
DOCUMENT TYPE: Journal; Article
COUNTRY: United States
LANGUAGE: English
SUMMARY LANGUAGE: English
AN 2001:32847122 BIOTECHNO
AB The **pregnancy-associated glycoproteins** (**PAG**) are abundant secretory products of the placental trophectoderm of ungulate species. They are structurally related to pepsin, having the capability to bind peptides. However, many cannot function as enzymes due to amino acid substitutions in and around the catalytic site. Here, we demonstrate that pigs, like cattle and sheep, but unlike equids, have multiple **PAG** genes. One of the transcribed porcine **PAG** (poPAG) genes, the one for poPAG2, was cloned. It had a nine-exon organization similar to that of other mammalian aspartic proteinase genes with an atypical TATA sequence. A total of 1.2 kbp upstream from exon 1 was sequenced. This region shared identity (>65%) with the promoter regions of the **bovine** (bo) PAG1, boPAG2 and equine (eq) **PAG** genes, but not with other aspartyl proteinase genes, including that of pepsinogen A. Nor were there clear similarities to the promoters of other genes with trophoblast-specific expression. Of the different poPAG2 promoter constructs tested in transfection experiments in two human (JAr and JEG3) and one rat (Rcho) choriocarcinoma cell lines, only the shortest (-149 bp) was required to provide full expression of a luciferase reporter. Although this short promoter was not active in Cos-1 and L-929 cells, it was active in CHO cells, a transformed non-trophoblast hamster ovarian cell line. Co-transfection of Ets2 elevated the activity of this short promoter approximately six-fold in JAr cells, but, disruption of the two putative Ets sites did not alter the ability of Ets2 to transactivate the promoter. In the nontrophoblast cell lines, Ets2 failed to elicit any response. Ets2 responsiveness may be a common feature of most or all trophoblast-expressed genes, although in the case of poPAG2, the effect may be indirect. .COPYRGT. 2001 Wiley-Liss, Inc.

L78 ANSWER 11 OF 38 BIOTECHNO COPYRIGHT 2004 Elsevier Science B.V. on STN
DUPLICATE
ACCESSION NUMBER: 2000:30183300 BIOTECHNO

TITLE: Adaptive diversification within a large family of recently duplicated, placentally expressed genes
AUTHOR: Hughes A.L.; Green J.A.; Garbayo J.M.; Roberts R.M.
CORPORATE SOURCE: R.M. Roberts, Department of Animal Sciences, University of Missouri, Columbia, MO 65211, United States.
E-mail: robertsrm@missouri.edu
SOURCE: Proceedings of the National Academy of Sciences of the United States of America, (28 MAR 2000), 97/7 (3319-3323), 33 reference(s)
CODEN: PNASA6 ISSN: 0027-8424
DOCUMENT TYPE: Journal; Article
COUNTRY: United States
LANGUAGE: English
SUMMARY LANGUAGE: English
AN 2000:30183300 BIOTECHNO
AB The **pregnancy-associated glycoproteins** (**PAG**) are putative peptide- binding proteins and products of a large family of genes whose expression is localized to the placental surface epithelium of artiodactyl species. We have tested the hypothesis that natural selection has favored diversification of these genes by examining patterns of nucleotide substitution in a sample of 28 closely related **bovine**, caprine, and ovine family members that are expressed only in trophoblast binucleate cells. Three observations were made. First, in codons encoding highly variable domains of the proteins, there was a greater accumulation of both synonymous and nonsynonymous mutations than in the more conserved regions of the genes. Second, in the variable regions, the mean number of nonsynonymous nucleotide substitutions per site was significantly greater than the mean number of synonymous substitutions per site. Third, nonsynonymous changes affecting amino acid charge occurred more frequently than expected under random substitution. This unusual pattern of nucleotide substitution implies that natural selection has acted to diversify these **PAG** molecules at the amino acid level, which in turn suggests that these molecules have undergone functional diversification. We estimate that the binucleate cell-expressed **PAG** originated 52 ± 6 million years ago, soon after the divergence of the ruminant lineage. Thus, rapid functional diversification of **PAG** expressed in trophoblast binucleate cells seems to have been associated with the origin of this unique placental adaptation.

L78 ANSWER 12 OF 38 BIOTECHNO COPYRIGHT 2004 Elsevier Science B.V. on STN
DUPLICATE
ACCESSION NUMBER: 2000:30333744 BIOTECHNO
TITLE: **Pregnancy**-associated **bovine** and ovine glycoproteins exhibit spatially and temporally distinct expression patterns during **pregnancy**
AUTHOR: Green J.A.; Xie S.; Quan X.; Bao B.; Gan X.; Mathialagan N.; Beckers J.- F.; Roberts R.M.
CORPORATE SOURCE: Dr. R.M. Roberts, Department of Animal Sciences, University of Missouri, 158 Animal Science Research Center, 920 E. Campus Dr., Columbia, MO 65211-5300, United States.
E-mail: robertsrm@missouri.edu
SOURCE: Biology of Reproduction, (2000), 62/6 (1624-1631), 27 reference(s)
CODEN: BIREBV ISSN: 0006-3363
DOCUMENT TYPE: Journal; Article
COUNTRY: United States
LANGUAGE: English
SUMMARY LANGUAGE: English
AN 2000:30333744 BIOTECHNO
AB The **pregnancy-associated glycoproteins** (**PAG**) constitute a large family of recently duplicated genes. They

show structural resemblance to pepsin and related aspartic proteinases. A total of 21 **bovine** (bo) **PAG** and 9 ovine (ov) **PAG** cDNA have been identified. Phylogenetic analysis indicated that the **PAG** are divided into two main groupings that accurately reflect their tissue expression, as determined by in situ hybridization, in the first pattern, represented by ovPAG-2 and boPAG-2, -8, -10, and -11 (where the numbering is arbitrary and reflects order of discovery within species), expression occurred throughout the outer epithelial layer of the placenta (trophectoderm). The second pattern was predominant localization to binucleate cells. Ribonuclease protection assays, which allow discrimination between closely related transcripts, have shown that the expression of **PAG** varies in a temporal manner over **pregnancy**. Of those **bovine PAG** expressed predominantly in binucleate cells, boPAG-1, -6, and -7 are expressed weakly, if at all, by Day 25 placenta, but are present at the middle and end of **pregnancy**. Others, such as boPAG-4, -5, and -9, are expressed at Day 25 and at earlier stages. Although not among the earliest **PAG** produced by the trophoblast, boPAG-1 has been used for **pregnancy** diagnosis, particularly in dairy cows, where there is a major need for a sensitive method capable of detecting **pregnancy** within 1 mo of conception. It seems likely that some of the newly discovered **PAG** will be better candidates than **PAG**-1 for **pregnancy** diagnosis.

L78 ANSWER 13 OF 38 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved. (2004) on STN DUPLICATE 10

ACCESSION NUMBER: 2001:34546 AGRICOLA
DOCUMENT NUMBER: IND22562879
TITLE: Chemiluminescence of **bovine** polymorphonuclear leucocytes during the periparturient period and relation with metabolic markers and **bovine pregnancy-associated glycoprotein**.
AUTHOR(S): Hoeben, D.; Monfardini, E.; Opsomer, G.; Burvenich, C.; Dosogne, H.; Kruif, A. de.; Beckers, J.F.
AVAILABILITY: DNAL (44.8 J823)
SOURCE: The Journal of dairy research, May 2000. Vol. 67, No. 2. p. 249-259
Publisher: Cambridge : Cambridge University Press, 1929
CODEN: JDRSAN; ISSN: 0022-0299
NOTE: Includes references
PUB. COUNTRY: England; United Kingdom
DOCUMENT TYPE: Article
FILE SEGMENT: Non-U.S. Imprint other than FAO
LANGUAGE: English

L78 ANSWER 14 OF 38 BIOTECHNO COPYRIGHT 2004 Elsevier Science B.V. on STN DUPLICATE

ACCESSION NUMBER: 1999:29196756 BIOTECHNO
TITLE: Identification of a new aspartic proteinase expressed by the outer chorionic cell layer of the equine placenta
AUTHOR: Green J.A.; Xie S.; Szafranska B.; Gan X.; Newman A.G.; McDowell K.; Roberts R.M.
CORPORATE SOURCE: R.M. Roberts, Department of Animal Sciences, University of Missouri, 158 Animal Science Research Center, Columbia, MO 65211-5300, United States. E-mail: robertsrm@missouri.edu
SOURCE: Biology of Reproduction, (1999), 60/5 (1069-1077), 36 reference(s)
CODEN: BIREBV ISSN: 0006-3363

DOCUMENT TYPE: Journal; Article
COUNTRY: United States
LANGUAGE: English
SUMMARY LANGUAGE: English
AN 1999:29196756 BIOTECHNO
AB The **pregnancy-associated glycoproteins** (**PAGs**) are placental antigens that were initially characterized as **pregnancy** markers in the maternal circulation of domestic ruminant species. They are members of the aspartic proteinase gene family, having greatest sequence identity with pepsinogens. However, some are not capable of functioning as enzymes. The **PAGs** are associated with a large gene family within the Artiodactyla order (cattle, camels, pigs). So far, no members of this family have been characterized in species outside this order. This report describes the cloning and initial characterization of a **PAG**-like protein (equine **PAG** or ePAG) expressed in the placenta of the horse and zebra (order Perrisodactyla). Equine **PAG** is a proteinase capable of degrading .sup.1.sup.4C-hemoglobin and catalyzing the removal of its own pro-peptide. The ePAG mRNA is restricted to the chorion both prior to implantation and in the term placenta. Equine **PAG** is secreted from cultured placental tissue as both a processed (mature) and unprocessed (zymogen) form. Equine **PAG** shares similar identity with the **PAGs** and pepsinogens and probably arose from a pepsinogen-like precursor that gained the ability to be expressed in the placenta. The promoter of the ePAG gene shares sequence identity with the promoter from a **bovine PAG** gene but not with promoters of other aspartic proteinases. Therefore, we hypothesize that ePAG is a remnant of the pepsinogen-like progenitor gene that was expanded within the Artiodactyla to create the large and highly diverse **PAG** family.

L78 ANSWER 15 OF 38 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America.
(2004) on STN DUPLICATE 12
ACCESSION NUMBER: 2000:59986 AGRICOLA
DOCUMENT NUMBER: IND22057239
TITLE: Early pregnancy diagnosis in goats by determination of pregnancy-associated glycoprotein concentrations in plasma samples.
AUTHOR(S): Gonzalez, F.; Sulon, J.; Garbayo, J.M.; Batista, M.; Cabrera, F.; Calero, P.; Gracia, A.; Beckers, J.F.
CORPORATE SOURCE: Faculty of Veterinary, Canaria, Spain.
AVAILABILITY: DNAL (QP251.A1T5)
SOURCE: Theriogenology, Sept 1999. Vol. 52, No. 4. p. 717-725
Publisher: New York, N.Y. : Elsevier Science Inc.
CODEN: THGNBO; ISSN: 0093-691X
NOTE: Includes references
PUB. COUNTRY: New York (State); United States
DOCUMENT TYPE: Article
FILE SEGMENT: U.S. Imprints not USDA, Experiment or Extension
LANGUAGE: English
AB Different RIA systems available for measuring the concentrations of **pregnancy-associated glycoproteins** (**PAGs**) in dairy goats were compared in order to evaluate their accuracy in early **pregnancy** diagnosis. Plasma concentrations of **PAGs** were determined by 3 heterologous RIA systems with a **bovine PAG** standard and tracer in combination with antisera anti-ovine **PAG** (RIA 1), anti-caprine **PAG** (55+62) (RIA 2), anti-caprine **PAG**(55+59) (RIA 3), and by 2 homologous RIA systems that employed caprine **PAG**(55+62) and caprine **PAG**(55+59) and their specific antisera (RIAs 4 and 5, respectively). In all of the RIAs, the mean concentrations of **PAGs** were significantly higher ($P < 0.01$) in **pregnant** than in

nonpregnant goats from Day 21 onwards after breeding. On Day 21, the accuracy rates of early **pregnancy** diagnoses were 56% (RIA 1), 96% (RIA 2), 99% (RIA 3), 95% (RIA 4) and 90% (RIA 5), whereas on Day 28 these rates were > 99% for RIAs 2, 3, 4 and 5. The RIAs for **PAGs** depend on proteins from the placenta being present in maternal plasma and require only a single sample of blood, to distinguish **pregnant** goats from those that fail to return to estrus for other reasons. The homologous and semiheterologous assays are highly accurate as early as Day 21 of **pregnancy**.

L78 ANSWER 16 OF 38 LIFESCI COPYRIGHT 2004 CSA on STN
ACCESSION NUMBER: 1999:72603 LIFESCI
TITLE: In vitro effect of ketone bodies, glucocorticosteroids and **bovine pregnancy-associated glycoprotein** on cultures of bone marrow progenitor cells of cows and calves
AUTHOR: Hoeben, D.; Burvenich, C.; Massart-Leen, A.M.; Lenjou, M.; Nijs, G.; Van Bockstaele, D.; Beckers, J.F.
CORPORATE SOURCE: Department of Physiology, Biochemistry, and Biometrics, Milk Secretion and Mastitis Research Center, Faculty of Veterinary Medicine, University of Gent, Salisburylaan 133, B-9820 Merelbeke, Belgium
SOURCE: Veterinary Immunology and Immunopathology [Vet. Immunol. Immunopathol.], (19990524) vol. 68, no. 2-4, pp. 231-242. ISSN: 0165-2427.
DOCUMENT TYPE: Journal
FILE SEGMENT: F
LANGUAGE: English
SUMMARY LANGUAGE: English
AB Changes in the number, maturity and function of neutrophils, concomitant changes in plasma concentrations of hormones and metabolites, and the increased susceptibility of cows to infectious diseases around parturition, led us to investigate the effect of beta -hydroxybutyric acid (BHBA), acetoacetic acid (AcAc), hydrocortisone-21-acetate (HCAc) and **bovine pregnancy-associated glycoprotein** (bPAG) on the proliferation of **bovine** bone marrow progenitor cells in methylcellulose in vitro cultures. Myeloid progenitors were stimulated with concanavalin A-stimulated leukocyte conditioned medium (LCM) and erythroid progenitors with erythropoetin in the presence of hemin. Erythroid and myeloid colonies were scored after five and seven days, respectively. BHBA and AcAc induced inhibitory effects on the proliferation of **bovine** bone marrow cells at concentrations of 1.0, 2.5, and 5.0 mM. HCAc significantly inhibited growth of progenitors at concentrations of 10, 20, 50, and 100 ng/ml, and bPAG at concentrations of 2400 and 3000 ng/ml. The results of this study suggest that in the cow high concentrations of BHBA, AcAc, HCAc and bPAG, which can be reached in the circulation around calving, could alter the number of circulating neutrophils after parturition. This phenomenon might contribute to the increased susceptibility of dairy cows to environmental mastitis.

L78 ANSWER 17 OF 38 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved. (2004) on STN DUPLICATE 13
ACCESSION NUMBER: 2001:58692 AGRICOLA
DOCUMENT NUMBER: IND23219136
TITLE: In vitro effect of ketone bodies, glucocorticosteroids and **bovine pregnancy-associated glycoprotein** on cultures of bone marrow progenitor cells of cows and calves.
AUTHOR(S): Hoeben, D.; Burvenich, C.; Massart-Leen, A.M.; Lenjou, M.; Nijs, G.; Bockstaele, D. van.; Beckers, J.F.
AVAILABILITY: DNAL (SF757.2.V38)

SOURCE: Veterinary immunology and immunopathology, May 1999. Vol. 68, No. 2/4. p. 229-240
Publisher: Amsterdam : Elsevier.
CODEN: VIIMDS; ISSN: 0165-2427
NOTE: Includes references
PUB. COUNTRY: Netherlands
DOCUMENT TYPE: Article
FILE SEGMENT: Non-U.S. Imprint other than FAO
LANGUAGE: English

L78 ANSWER 18 OF 38 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved. (2004) on STN
ACCESSION NUMBER: 1999:69362 AGRICOLA
DOCUMENT NUMBER: IND22007328
TITLE: Evaluation of false ultrasonographic diagnoses in cows by measuring plasma levels of **bovine pregnancy-associated glycoprotein** 1.
AUTHOR(S): Szenci, O.; Taverne, M.A.M.; Beckers, J.F.; Sulon, J.; Varga, J.; Borzsonyi, L.; Hanzen, C.; Schekk, G.
CORPORATE SOURCE: University of Veterinary Science, Budapest, Hungary.
AVAILABILITY: DNAL (41.8 V641)
SOURCE: The Veterinary record : journal of the British Veterinary Association, Mar 21, 1998. Vol. 142, No. 12. p. 304-306
Publisher: London : The British Veterinary Association.
CODEN: VETRAX; ISSN: 0042-4900
NOTE: Includes references
PUB. COUNTRY: England; United Kingdom
DOCUMENT TYPE: Article
FILE SEGMENT: Non-U.S. Imprint other than FAO
LANGUAGE: English

L78 ANSWER 19 OF 38 LIFESCI COPYRIGHT 2004 CSA on STN
ACCESSION NUMBER: 1998:57305 LIFESCI
TITLE: SINEVA polymorphism and mapping of the **bovine pregnancy-associated glycoprotein** 1 gene
AUTHOR: Martin-Burriel, I.; Elduque, C.; Osta, R.; Laurent, P.; Barendse, W.; Zaragoza, P.
CORPORATE SOURCE: Laboratorio de Genetica Bioquimica, Fac. de Veterinaria, Univ. de Zaragoza, Miguel Servet, 177, 50013 Zaragoza, Spain
SOURCE: MAMM. GENOME, (19980200) vol. 9, no. 2, pp. 179-180. ISSN: 0938-8990.
DOCUMENT TYPE: Journal
FILE SEGMENT: G
LANGUAGE: English
AB Method of mapping: A total of 174 animals representing seven informative families of the International **Bovine** Reference Panel (IBRP) were genotyped for linkage analysis. Genotypes were merged with the cattle Genotypic Database, and all possible pairwise comparisons were performed with CRI-MAP (v2.4 SunOs). Somatic cell hybrid analysis was performed with a well-characterized panel of 38 hamster-**bovine** hybrid clones. Database deposit information: GenBank accession number: L27833. Method of detection: The GenBank and EMBL database were searched for sequences homologous to several Bos taurus SINEs (Short Interspersed Nuclear Elements). The 5' flanking sequence of the **bovine pregnancy-associated glycoprotein** 1 gene showed 85% identity in a 167-bp overlap to the SINE sequence Bov-B (accession number X64125). An A/T rich tract was found at the 3' end of the

overlapping region, showing the (T) sub(7)GGT(A) sub(21) repeat motif. PCR primers were designed on the basis of the flanking sequence. The amplified fragment showed the expected size (249 bp), and PCR products varied in length in denaturing polyacrylamide gel electrophoresis. Mendelian inheritance of six alleles was observed in the IBRP families. Furthermore, analysis of the **bovine**-hamster hybrid cell panel with these PAG1B primers confirmed the assignment of this gene to **bovine** Chr 29 with a significant correlation coefficient of 0.9 (according to Chevalet and Corpet). Previously identified homolog: To our knowledge, this work is the first report of the assignment of PAG1B or any other **pregnancy**-specific protein gene. Discussion: **Bovine** **pregnancy-associated glycoprotein** 1 (also called **pregnancy**-specific protein B) is a member of the aspartic proteinase family secreted by the chorionic epithelium of the placenta and suggested to be enzymatically inactive. **Bovine** PAG1B can be detected in maternal blood soon after implantation until term. Because of their relative abundance and localized expression, it is possible that these glycoproteins have a function during the **pregnancy**, but that function remains unclear. The PAG1B polymorphism described in this paper could be considered as a SINEVA (SINE variable poly(A)). Even though the **bovine** genome seems to present a minor amount of SINEVA polymorphism compared with other human and domestic species and di- and trinucleotide repeats appear the most frequent SINE-associated polymorphism, with a database search, we have found several of these polymorphisms. Because of their presence near or inside gene sequences and their high degree of polymorphism, these SINEVA markers can be used for linkage mapping of conserved regions. The polymorphism reported in this work has allowed us to map the PAG1B gene, showing that the SINEVA analysis is a useful mapping tool in the **bovine** genome. Our data show linkage between PAG1B and IGF2 on BTA29, and it corresponds to part of HSA11, where IGF2 is located (Genome Data Base). Since this is the first time that a PAG1B gene has been mapped in any species, we confirmed the assignment using two different mapping strategies, linkage and somatic cell hybrid analysis. We expect that this gene would appear on human Chr 11.

L78 ANSWER 20 OF 38 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved. (2004) on STN DUPLICATE 14

ACCESSION NUMBER: 1999:22046 AGRICOLA
DOCUMENT NUMBER: IND21971218
TITLE: Comparison of ultrasonography, **bovine** **pregnancy**-specific protein B, and **bovine pregnancy-associated** **glycoprotein** 1 tests for **pregnancy** detection in dairy cows.
AUTHOR(S): Szenci, O.; Beckers, J.F.; Humblot, P.; Sulon, J.; Sasser, G.; Taverne, M.A.M.; Varga, J.; Baltsen, R.; Schekk, G.
CORPORATE SOURCE: University of Veterinary Science, Budapest, Hungary.
AVAILABILITY: DNAL (QP251.A1T5)
SOURCE: Theriogenology, July 1, 1998. Vol. 50, No. 1. p. 77-88
Publisher: New York, N.Y. : Elsevier Science Inc.
CODEN: THGNBO; ISSN: 0093-691X
NOTE: Includes references
PUB. COUNTRY: New York (State); United States
DOCUMENT TYPE: Article
FILE SEGMENT: U.S. Imprints not USDA, Experiment or Extension
LANGUAGE: English

AB At Days 26 to 58 after AI, 138 Holstein-Friesian dairy cows were repeatedly examined by ultrasonography, using a 7.5 MHz linear-array rectal transducer. The total calving rate was 37.6% (52/138), and late embryonic mortality occurred 8.6% of the cows (12/138). On the days of

ultrasound scanning, blood samples were drawn from the jugular vein for measuring the concentration of **bovine pregnancy** -specific protein B (bPSPB) and **bovine pregnancy-associated glycoprotein** 1 (bPAG 1). When compared with calving results, there were no significant differences in accurate diagnosis of **pregnant** cows were found between the 3 methods. However, when recognition of an embryo proper with a beating heart was used as the criterion for positive ultrasonographic diagnosis significantly fewer (P<0.001) **pregnant** cows were correctly identified than by the other 2 tests. When compared with the noncalving cows, significantly fewer (p<0.001) false positive diagnoses were made by the 2 ultrasonographic tests than by the PSPB and bPAG 1 tests, while significantly fewer (P<0.001) false positive diagnoses were made by the bPSPB test than by the bPAG 1 test. The accuracy of detecting nonpregnant animals by both protein tests was limited by the relatively long half-life of these proteins after calving and by early embryonic mortality.

L78 ANSWER 21 OF 38 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved. (2004) on STN DUPLICATE 15

ACCESSION NUMBER: 1998:42474 AGRICOLA
DOCUMENT NUMBER: IND21233781
TITLE: The diversity and evolutionary relationships of the pregnancy-associated glycoproteins, an aspartic proteinase subfamily consisting of many trophoblast-expressed genes.
AUTHOR(S): Xie, S.C.; Green, J.; Bixby, J.B.; Szafranska, B.; DeMartini, J.C.; Hecht, S.; Roberts, R.M.
AVAILABILITY: DNAL (500 N21P)
SOURCE: Proceedings of the National Academy of Sciences of the United States of America, Nov 25, 1997. Vol. 94, No. 24. p. 12809-12816
Publisher: Washington, D.C. : National Academy of Sciences,
CODEN: PNASA6; ISSN: 0027-8424
NOTE: Includes references
PUB. COUNTRY: District of Columbia; United States
DOCUMENT TYPE: Article; Conference
FILE SEGMENT: U.S. Imprints not USDA, Experiment or Extension
LANGUAGE: English

AB The **pregnancy-associated glycoproteins** (**PAGs**) are structurally related to the pepsins, thought to be restricted to the hooved (ungulate) mammals and characterized by being expressed specifically in the outer epithelial cell layer (chorion/trophectoderm) of the placenta. At least some **PAGs** are catalytically inactive as proteinases, although each appears to possess a cleft capable of binding peptides. By cloning expressed genes from ovine and **bovine** placental cDNA libraries, by Southern genomic blotting, by screening genomic libraries, and by using PCR to amplify portions of **PAG** genes from genomic DNA, we estimate that cattle, sheep, and most probably all ruminant Artiodactyla possess many, possibly 100 or more, **PAG** genes, many of which are placentally expressed. The **PAGs** are highly diverse in sequence, with regions of hypervariability confined largely to surface-exposed loops. Nonsynonymous (replacement) mutations in the regions of the genes coding for these hypervariable loop segments have accumulated at a higher rate than synonymous (silent) mutations. Construction of distance phylograms, based on comparisons of **PAG** and related aspartic proteinase amino acid sequences, suggests that much diversification of the **PAG** genes occurred after the divergence of the Artiodactyla and Perissodactyla, but that at least one gene is represented outside the hooved species. The results also suggest that positive selection of duplicated genes has acted to provide considerable functional diversity among the **PAGs**,

whose presence at the interface between the placenta and endometrium and in the maternal circulation indicates involvement in fetal-maternal interactions.

L78 ANSWER 22 OF 38 BIOTECHNO COPYRIGHT 2004 Elsevier Science B.V. on STN
DUPLICATE
ACCESSION NUMBER: 1997:27452178 BIOTECHNO
TITLE: Plasma **bovine pregnancy-associated glycoprotein** concentrations throughout gestation in relationship to fetal number in the cow
AUTHOR: Patel O.V.; Sulon J.; Beckers J.F.; Takahashi T.; Hirako M.; Sasaki N.; Domeki I.
CORPORATE SOURCE: N. Sasaki, Dept. of Veterinary Surg./Obstetrics, Faculty of Agriculture, University of Tokyo, Yayoi 1-1-1, Bunkyo-ku, Tokyo 113, Japan.
SOURCE: European Journal of Endocrinology, (1997), 137/4 (423-428), 25 reference(s)
CODEN: EJOEEP ISSN: 0804-4643
DOCUMENT TYPE: Journal; Article
COUNTRY: Norway
LANGUAGE: English
SUMMARY LANGUAGE: English
AN 1997:27452178 BIOTECHNO
AB This study characterized the peripheral plasma **bovine pregnancy- associated glycoprotein** (bPAG) profile throughout gestation and examined the effect of stage of gestation and fetal number on this profile in Holstein cows after non-surgical embryo transfer. Cows (n = 12) were divided into three groups: group 1 = normal singleton **pregnancies** (n = 5); group 2 = normal twin **pregnancies** (n = 5); group 3 = abnormal twin **pregnancies** (n = 2). Blood was collected about every third day from day 0 (defined as the first day of standing estrus), then daily for the last 10 days of gestation, and sampling was stopped one day postpartum. The time-related changes in plasma bPAG concentrations were significantly ($P < 0.01$) affected by the stage of gestation and fetal number ($P < 0.01$), except during the last 10 days of gestation. In both normal **pregnancy** groups, bPAG concentration increased rapidly during the first trimester (0.5 ± 0.1 to 14.6 ± 1.7 ng/ml and 1.0 ± 0.6 to 21.8 ± 4.8 ng/ml, in singleton and twin-bearing groups respectively), then progressively between days 160 and 20 prepartum (31.6 ± 6.2 to 114.3 ± 31.3 ng/ml and 41.6 ± 7.4 to 155.8 ± 36.6 ng/ml in singleton and twin-bearing cows respectively). The mean concentration between days 20 and 10 prepartum approximately tripled ($P < 0.001$) in both these groups of cows (114.3 ± 31.1 to 493.0 ± 75.3 ng/ml and 155.8 ± 36.6 to 409.3 ± 114.7ng/ml in singleton and twin-bearing cows respectively), but between days 10 prepartum and parturition the values increased about threefold ($P < 0.01$) in the singleton group (493.0 ± 75.3 to 1352.8 ± 286.5 ng/ml) and fivefold ($P<0.001$) in the twin-bearing group (409.3 ± 114.7 to 2154.0 ± 505.7ng/ml). The two cows in group 3 that gave birth prematurely in a stillborn calf or to a schistosomas reflexus calf exhibited an aberrant bPAG profile. Our results indicate that peripheral bPAG concentrations are correlated to the stage of gestation and fetal number, and that the profile of the peripheral plasma concentrations provides a useful indication of the feto-placental status.

L78 ANSWER 23 OF 38 BIOTECHNO COPYRIGHT 2004 Elsevier Science B.V. on STN
ACCESSION NUMBER: 1997:27322410 BIOTECHNO
TITLE: Recent developments and potentialities for reducing embryo mortality in ruminants: The role of IFN-τ and other cytokines in early **pregnancy**
AUTHOR: Martal J.; Chene N.; Camous S.; Huynh L.; Lantier F.; Hermier P.; L'Haridon R.; Charpigny G.; Charlier M.;

Chaouat G.
CORPORATE SOURCE: J. Martal, Unite d'Endocrinologie de l'Embryon, Station de Physiologie Animale, INRA, 78352 Jouy-en-Josas Cedex, France.
SOURCE: Reproduction, Fertility and Development, (1997), 9/3 (355-380), 250 reference(s)
CODEN: RFDEEH ISSN: 1031-3613
DOCUMENT TYPE: Journal; Conference Article
COUNTRY: Australia
LANGUAGE: English
SUMMARY LANGUAGE: English
AN 1997:27322410 BIOTECHNO
AB This review considers the potential reduction of embryo mortality in vitro and in vivo in ruminants. Data on cytokines provided by different fields of reproductive immunology and biology were collated. Because of the crucial importance of the local interactions between the embryo and its dam, the expression of growth-factor and cytokine genes was analysed in the embryo proper, trophoblast, oviduct and endometrium by reverse transcriptase polymerase chain reaction in sheep and in cattle during the pre- and periimplantation periods. Many deleterious cytokines, such as tumour necrosis factor-α, interferon-γ (IFN-γ), interleukin-2 (IL-2), and beneficial cytokines, such as transforming growth factor-β, leukaemia inhibiting factor, colony-stimulating factor-1 (CSF-1), ganulocyte-macrophage CSF, IL-1, IL-3, IL-4, IL-6 < IL-10 and IFN-τ appeared to be involved in embryo survival in ruminants and other species. Their administration is efficient in a murine experimental model (CBA/JxDBA/2) of embryonic and fetal mortality. For instance, recombinant ovine IFN-τ (roIFN-τ) injected at the moment of implantation drastically reduces embryonic mortality in this model. In ruminants, roIFN-τ and recombinant **bovine** IFN-τ are very efficient in maintaining progesterone luteal secretion in cyclic animals. The involvement of IFN-τ in the mechanisms of maternal **pregnancy** recognition are particularly detailed in relation to inhibition of 13, 14 dihydro-15-keto-prostaglandin F.sub.2(α) (PGFM) pulses and oxytocin uterine receptivity. A synthetic model of the anti-luteolytic effects of IFN-τ on the endometrial cell is proposed. Finally, the particular potential of serum **pregnancy**-specific proteins (PSPs: PSPB, PSP60, **pregnancy -associated glycoprotein**) for monitoring embryo survival, with examples given for cattle and sheep is underlined.

L78 ANSWER 24 OF 38 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved. (2004) on STN DUPLICATE 17
ACCESSION NUMBER: 97:18463 AGRICOLA
DOCUMENT NUMBER: IND20551759
TITLE: Pepsin-inhibitory activity of the uterine serpins.
AUTHOR(S): Mathialagan, N.; Hansen, T.R.
CORPORATE SOURCE: University of Missouri, Columbia, MO.
SOURCE: Proceedings of the National Academy of Sciences of the United States of America, Nov 26, 1996. Vol. 93, No. 24. p. 13653-13658
Publisher: Washington, D.C. : National Academy of Sciences,
CODEN: PNASA6; ISSN: 0027-8424
NOTE: Includes references
PUB. COUNTRY: District of Columbia; United States
DOCUMENT TYPE: Article; Conference
FILE SEGMENT: U.S. Imprints not USDA, Experiment or Extension
LANGUAGE: English
AB Among the major products secreted by the uteri of cattle, sheep, and pigs during **pregnancy** are glycoproteins with amino acid sequences that place them in the serpin (serine proteinase inhibitor) superfamily

of proteins. The inferred amino acid sequences for **bovine** uterine serpin (boUS-1) and ovine uterine serpin (ovUS-1) exhibit about 72% sequence identity to each other but only about 50% and 56% identity, respectively, to two distinct porcine uterine serpins (poUS-1 and poUS-2). Despite these differences in primary structure, the uterine serpins possess well-conserved reactive center loop regions that contain several motifs present in the propeptide regions of pepsinogens. One such motif, VVVK, aligns with the first 4 amino acids of the aspartic proteinase inhibitor pepstatin. Although no inhibitory activity toward any serine proteinase has been found, at least one of the uterine serpins, ovUS-1, can bind specifically to immobilized pepsin A and can weakly inhibit the proteolytic activities of pepsin A and C (but not cathepsins D and E). OvUS-1 is the first specific inhibitor of aspartic proteinases to be identified in vertebrates and provides another example of a serpin with "crossover" activity. The **pregnancy-associated glycoproteins** (**PAGs**), which are secreted by the trophoblast layer of the placentas of ungulate species and are inactive members of the aspartic proteinase family, can also bind ovUS-1 and may be the natural target partners for the uterine serpins.

L78 ANSWER 25 OF 38 BIOTECHNO COPYRIGHT 2004 Elsevier Science B.V. on STN
DUPLICATE

ACCESSION NUMBER: 1996:26366510 BIOTECHNO
TITLE: Comparative modelling and analysis of amino acid substitutions suggests that the family of **pregnancy-associated glycoproteins** includes both active and inactive aspartic proteinases
AUTHOR: Guruprasad K.; Blundell T.L.; Xie S.; Green J.; Szafranska B.; Nagel R.J.; McDowell K.; Baker C.B.; Roberts R.M.
CORPORATE SOURCE: Laboratory of Molecular Biology, Department of Crystallography, University of London,London WC1E 7HX, United Kingdom.
SOURCE: Protein Engineering, (1996), 9/10 (849-856)
CODEN: PRENE0 ISSN: 0269-2139
DOCUMENT TYPE: Journal; Article
COUNTRY: United Kingdom
LANGUAGE: English
SUMMARY LANGUAGE: English
AN 1996:26366510 BIOTECHNO
AB The **pregnancy-associated glycoproteins** (**PAGs**) are secretory products synthesized by the outer epithelial cell layer (chorion) of the placentas of various ungulate species. The amino acid sequences of eight **PAGs** have been inferred from cloned cDNA of cattle and sheep, as well as of the non-ruminant pig and horse. We compare the **PAG** sequences and present results of the three-dimensional models of boPAG-1 and ovPAG-1 that were constructed on the basis of the crystal structures of homologous porcine pepsin and **bovine** chymosin using a rule-based comparative modelling approach. Further, we compare peptide binding subsites defined by interactions with pepstatin and a decapeptide inhibitor (CH-66) modelled on the basis of crystal structures of other aspartic proteinases. We have extended our analysis of the peptide binding subsites to the other FAG molecules of known sequence by aligning the **PAG** sequences to the structural template derived from the pepsin family and by making use of the three-dimensional models of the boPAG-1 and ovPAG-1. The residues that are likely to affect peptide binding in the boPAG-1, ovPAG-1 and other FAG molecules have been identified. Sequence comparisons reveal that all **PAG** molecules may have evolved from a pepsin-like progenitor molecule with the equine **PAG** most closely related to the pepsins. The presence of substitutions at the S.sub.1 and other subsites relative to pepsin make it unlikely that either **bovine**, ovine or the porcine **PAG**-1 have catalytic activity. Only two

of the eight **PAGs** examined (porcine **PAG**-2 and equine **PAG**-1) retain features of active aspartic proteinases with pepsin-like activity. Our results indicate that in the **PAGs** so far characterized the peptide binding specificities differ significantly from each other and from pepsin, despite their high sequence identities. Analysis of the various peptide binding subsites demonstrates why both **bovine** and ovine **PAG**-1 are capable of binding pepstatin. The strong negative charge in the binding cleft of boPAG-1 and ovPAG-1 indicates a preference for lysine- or arginine-rich peptides. **PAGs** represent a family where the possible peptide binding function may be retained through their binding specificities, but where the catalytic activity may be lost in some cases, such as the boPAG-1, ovPAG-1 and the poPAG-1.

L78 ANSWER 26 OF 38 AGRICOLA (2004) on STN DUPLICATE 19

ACCESSION NUMBER: 97:6340 AGRICOLA
DOCUMENT NUMBER: IND20541550
TITLE: Pregnancies, calves and calf viability after transfer of in vitro produced bovine embryos.
AUTHOR(S): Schmidt, M.; Greve, T.; Avery, B.; Beckers, J.F.; Sulon, J.; Hansen, H.B.
CORPORATE SOURCE: Royal Veterinary and Agricultural University, Copenhagen, Denmark.
SOURCE: Theriogenology, Aug 1996. Vol. 46, No. 3. p. 527-539
Publisher: New York, N.Y. : Elsevier Science Inc.
CODEN: THGNBO; ISSN: 0093-691X
NOTE: Includes references
PUB. COUNTRY: New York (State); United States
DOCUMENT TYPE: Article
FILE SEGMENT: U.S. Imprints not USDA, Experiment or Extension
LANGUAGE: English

AB **Pregnancy**, parturition and calf survival following the transfer of embryos produced in vitro were monitored. A total of 44 blastocysts was transferred in pairs to 1 uterine horn ipsilateral to the corpus luteum (CL) of 22 synchronized heifers. At Day 42 of development 14 recipients (64%) were **pregnant**; the calving rate was also 64%. The twinning rate was 9/14 at Day 42 and 7/14 at birth, for an overall fetal mortality rate of 9%. The average gestation length was 281 and 275 d for single and twin **pregnancies**, respectively. Blood samples from recipients were collected for determination of **bovine pregnancy associated glycoprotein** (bPAG) from 2 wk after transfer and throughout the **pregnancy**. During the first trimester of **pregnancy**, the bPAG concentration was significantly higher in twin than in single bearing heifers, and the perinatal increase in bPAG was correlated positively with the total weight of the fetus(es). The percentage of male calves was 43%. The birth weight of twin individuals was 25 +/- 1 kg, which was 78% of the birthweight of the singletons (32 +/- 2 kg). One singleton calf was oversized, weighing 58 kg (80% more than the median weight of the other singletons). Stillbirths occurred in 21% of the twins, but in none of the singletons. Calf mortality during the first 14 d was higher for twins (4/11) than for singletons (1/7) due to infections and cerebellar hypoplasia. Karyotyping the calves detected no cytogenetically recognizable abnormalities. All calves were negative for BVD virus and IBR antibodies. The results of this study showed that although the incidence of fetal loss was low, there was an unacceptable high perinatal mortality of the calves. Thus it is likely that the blood supply through the placenta of animals **pregnant** with twins was impaired or it is possible that these fetuses and calves had increased stress susceptibility caused by the in vitro conditions. Furthermore, the birth of 1 oversized calf, 2 calves with cerebellar hypoplasia and 5 calves succumbing to infections seems to indicate that a proportion of in

vitro produced calves may suffer from factors inherent in the in vitro production system.

L78 ANSWER 27 OF 38 BIOTECHNO COPYRIGHT 2004 Elsevier Science B.V. on STN DUPLICATE
ACCESSION NUMBER: 1996:26369867 BIOTECHNO
TITLE: Use of glycoprotein assays for **pregnancy** diagnosis in white-tailed deer
AUTHOR: Osborn D.A.; Beckers J.-F.; Sulon J.; Gassett J.W.; Muller L.I.; Murphy B.P.; Miller K.V.; Marchinton R.L.
CORPORATE SOURCE: D. B. Warnell School of Forest Res., University of Georgia,Athens, GA 30602, United States.
SOURCE: Journal of Wildlife Management, (1996), 60/2 (388-393)
CODEN: JWMAA0 ISSN: 0022-541X
DOCUMENT TYPE: Journal; Article
COUNTRY: United States
LANGUAGE: English
SUMMARY LANGUAGE: English
AN 1996:26369867 BIOTECHNO
AB Analysis of blood for a protein associated with **pregnancy** has been suggested as a reliable alter native to traditional **pregnancy** tests for deer. However, the accuracy of this technique has not been tested throughout gestation in white-tailed deer (Odocoileus virginianus). In addition, quantification of protein relative to stage of gestation and fetal number has not been reported. To address these needs, sera collected from 6 captive white-tailed does before breeding, throughout gestation, and following parturition were tested by radioimmunoassays (RIA) developed using glycoproteins isolated from domestic cattle and sheep. These RIAs provide the first quantitative **pregnancy associated glycoprotein** (**PAG**) tests for deer. In our study, **PAG** levels increased throughout **pregnancy** and declined linearly following parturition. Beyond mid-gestation, **PAG** levels reflected in utero fetal number. The **bovine**-**PAG** (bPAG) assay was 100% accurate beyond day 65 of gestation. The ovine-**PAG** (oPAG) assay detected **pregnancy** by mean day 22 of gestation and was 100% accurate beyond day 32. Our oPAG-RIA is the most effective **pregnancy** test reported for white-tailed deer.

L78 ANSWER 28 OF 38 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved. (2004) on STN DUPLICATE 21
ACCESSION NUMBER: 96:47195 AGRICOLA
DOCUMENT NUMBER: IND20525868
TITLE: Trophoblast-specific processing and phosphorylation of pregnancy-associated glycoprotein-1 in Day 15 to 25 sheep placenta.
AUTHOR(S): Xie, S.; Nagel, R.J.; Green, J.; Beckers, J.F.; Roberts, R.M.
CORPORATE SOURCE: University of Missouri, Columbia, MO.
AVAILABILITY: DNAL (QL876.B5)
SOURCE: Biology of reproduction, Jan 1996. Vol. 54, No. 1. p. 122-129
Publisher: Madison, Wis. : Society for the Study of Reproduction.
CODEN: BIREBV; ISSN: 0006-3363
NOTE: Includes references
PUB. COUNTRY: United States; Wisconsin
DOCUMENT TYPE: Article
FILE SEGMENT: U.S. Imprints not USDA, Experiment or Extension
LANGUAGE: English
AB **Bovine** and ovine **pregnancy-associated glycoproteins**-1 (**PAG**-1) are products of binucleate

trophoblast cells and belong to the aspartic proteinase gene family. Estimates of their relative molecular masses have varied considerably, from 47 to 90 kDa, even though the mature polypeptide has been inferred to be no more than 330 amino acids in length and that the glycosylated recombinant form synthesized in Chinese hamster ovary (CHO) or COS-1 cells had an apparent mass of 46 kDa. To establish the relationships among the various molecular forms, metabolic labeling, immunoprecipitation, and electrophoretic analysis were used to follow the biosynthesis of ovine **PAG**-1 (ovPAG-1) in placental explants. In time-course studies, ovPAG-1 could first be detected within 10 min as a 70-kDa form within the tissue. With time, forms of intermediate (53-61 kDa) and low (47 kDa) molecular mass began to accumulate. The latter predominated in medium after 6 h labeling. Pulse chase studies established that the 70-kDa forms were the precursors of the smaller species. Inhibition of glycosylation with tunicamycin or treatment with N-glycosidase F confirmed that ovPAG-1 contained N-linked oligosaccharide chains, but that this carbohydrate accounted for only a relatively small fraction (8-10 kDa) of the apparent mass. Consecutive treatment with neuraminidase and O-glycanase also reduced the apparent molecular mass of the precursor by approximately 11 kDa. OvPAG-1 incorporated 32p from [32P]orthophosphate into phosphoserine and phosphothreonine, but there was no incorporation of 35S from [35S]sulfate. The basis of the differences in molecular mass between the precursor and the final products remains to be elucidated, but the differences seem likely to be due to some unusual form of posttranslational modification introduced in the binucleate cell. The results of the study appear to explain the disparate size values that have been reported for these placenta-derived proteins.

L78 ANSWER 29 OF 38 BIOTECHNO COPYRIGHT 2004 Elsevier Science B.V. on STN
ACCESSION NUMBER: 1995:25289593 BIOTECHNO
TITLE: Glycoproteins of the aspartyl proteinase gene family secreted by the developing placenta
AUTHOR: Roberts R.M.; Xie S.; Nagel R.J.; Low B.; Green J.; Beckers J.-F.
CORPORATE SOURCE: Department of Animal Sciences, University of Missouri,Columbia, MO 65211, United States.
SOURCE: Advances in Experimental Medicine and Biology, (1995), 362/- (231-240)
CODEN: AEMBAP ISSN: 0065-2598
DOCUMENT TYPE: Journal; Conference Article
COUNTRY: United States
LANGUAGE: English
SUMMARY LANGUAGE: English
AN 1995:25289593 BIOTECHNO
AB **Pregnancy** in cattle and sheep can be diagnosed by the presence of placentally-derived antigens (**pregnancy-associated glycoproteins** or **PAG**-1) in maternal serum soon after implantation begins at about Day 20 following conception. Molecular cloning of their cDNA has revealed that **PAG**-1 belong to the aspartic proteinase gene family and have about 50% amino acid sequence identity to pepsin. However, critical amino acid substitutions at the active site regions suggest that both **bovine** and ovine **PAG**-1 are enzymatically inactive. **PAG**-1 expression has been shown by in situ hybridization and immunocytochemistry to be localized to the trophoblast binucleate cells, which invade maternal uterine endometrium during implantation. The glycoproteins are concentrated in dense cytoplasmic granules that are discharged after the binucleate cells have migrated to the maternal side of the placental barrier. We suggest, therefore, that the **PAG**-1 might have an endocrine function either as carriers of other bioactive peptides or by acting as hormones themselves. Recently screening of placental libraries with nucleic acid probes has identified additional cDNA that are very abundant and code for polypeptides (**PAG**-2 and **PAG**-3) related to, but antigenically and structurally distinct from **PAG**

-1 described above. These molecules have sequences of amino acids at their catalytic centers that are consistent with their being potentially functional proteinases but their role during **pregnancy**, like that of **PAG**-1, is unclear.

L78 ANSWER 30 OF 38 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved. (2004) on STN DUPLICATE 22

ACCESSION NUMBER: 95:51172 AGRICOLA
DOCUMENT NUMBER: IND20474615
TITLE: The gene encoding **bovine pregnancy -associated glycoprotein**-1, an inactive member of the aspartic proteinase family.
AUTHOR(S): Xie, S.; Green, J.; Beckers, J.F.; Roberts, R.M.
CORPORATE SOURCE: University of Missouri, Columbia, MO.
AVAILABILITY: DNAL (QH442.A1G4)
SOURCE: Gene, 1995. Vol. 159, No. 2. p. 193-197
Publisher: Amsterdam : Elsevier Science Publishers.
CODEN: GENED6; ISSN: 0378-1119
NOTE: Includes references
PUB. COUNTRY: Netherlands
DOCUMENT TYPE: Article
FILE SEGMENT: Non-U.S. Imprint other than FAO
LANGUAGE: English

AB **Bovine pregnancy-associated glycoprotein** 1 (bPAG1) is a member of the aspartic proteinase family. It becomes detectable in maternal serum soon after implantation and is produced specifically in the invasive binucleate cells of the placenta. As a result of a key mutation within its catalytic center, bPAG1 appears to be proteolytically inactive. Its gene consists of nine exons (size range 99-281 bp) and eight introns (87-1800 bp) organized in a manner very similar to those of proteolytically active mammalian aspartic proteinases. The transcription start point (tsp) is located 53 or 54 bp upstream from the start codon (ATG) and 19 bp downstream from a 5'-TATATAA sequence. Southern blot analyses have indicated the presence of two bPAG1 genes. By screening with an antiserum raised against bPAG1, a less common cDNA with 91% sequence identity to the bPAG1 transcript has been isolated from a placental cDNA library and presumably represents the second gene. At least eight other genes with sequences that hybridize relatively weakly to the bPAG1 probe are present in the **bovine** genome. Despite the similarities in the transcribed portion of the genes encoding PAG1, pepsinogen and other mammalian aspartic proteinases, the sequences upstream from the tsp of bPAG1 are unique.

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ACCESSION NUMBER: 96:26956 AGRICOLA
DOCUMENT NUMBER: IND20509387
TITLE: Porcine pregnancy-associated glycoproteins: new members of the aspartic proteinase gene family expressed in trophectoderm.
AUTHOR(S): Szafranska, B.; Xie, S.C.; Green, J.; Roberts, R.M.
CORPORATE SOURCE: University of Agriculture and Technology, Olsztyn, Poland.
AVAILABILITY: DNAL (QL876.B5)
SOURCE: Biology of reproduction, July 1995. Vol. 53, No. 1. p. 21-28
Publisher: Madison, Wis. : Society for the Study of Reproduction.
CODEN: BIREBV; ISSN: 0006-3363
NOTE: Includes references

PUB. COUNTRY: United States; Wisconsin
DOCUMENT TYPE: Article
FILE SEGMENT: U.S. Imprints not USDA, Experiment or Extension
LANGUAGE: English

AB **Pregnancy-associated glycoproteins** (**PAG**) are members of the aspartyl proteinase gene family that were initially identified in cattle (bPAG) and sheep (oPAG) as placenta-specific antigens in maternal blood. The objective of this study was to determine whether **PAG** are expressed in pig trophoblast. A porcine conceptus cDNA library was screened with 32P-labeled ovine and **bovine PAG** cDNA. Of the approximately 10(4) plaques that were initially screened, a very high number (approximately 5.3%) were positive. Two distinct types were identified, and full-length clones representing each type (1371 bp, pPAG1; 1378 bp, pPAG2) were fully sequenced in both directions. Their open reading frames coded polypeptides of 389 and 387 amino acids, respectively, including 15 amino acid signal peptides. Each had several potential sites for N-glycosylation. Both were members of the aspartic proteinase gene family, with approximately 50% amino acid sequence identity to porcine pepsinogen and 64% to each other. They were only distantly related to **PAG** of ruminant species (53% and 49% identity in amino acid sequence to oPAG1 and bPAG1, respectively). Interestingly, pPAG1 had amino acid substitutions within its catalytic center (Gly leads to Ala81, domain 1; Thr leads to Ser263, Thr leads to Ser265, Ser leads to Ala266, domain 2) that together were likely to render it enzymatically inactive, whereas pPAG2 retained sequences identical to pepsin in these regions. Western blotting of secretory products of porcine trophoblast with anti-oPAG1 and anti-bPAG2 antisera indicated that pPAG, like **PAG** from ruminants, had an unexpectedly high Mr (approximately 70000). Northern blot analysis revealed abundant mRNA for both pPAG (approximately 1.7 kb) as early as Day 15, which persisted throughout **pregnancy**. In situ hybridization localized pPAG mRNA to chorionic cells tightly adherent to the maternal luminal epithelium within the deep folds of endometrium. In conclusion, **PAG** are not restricted to species with a synepitheliochorial placenta, and their function may not depend upon their potential for peptide bond cleavage.

L78 ANSWER 32 OF 38 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved. (2004) on STN DUPLICATE 24

ACCESSION NUMBER: 95:43870 AGRICOLA
DOCUMENT NUMBER: IND20468635
TITLE: A novel glycoprotein of the aspartic proteinase gene family expressed in bovine placental trophectoderm.
AUTHOR(S): Xie, S.; Low, B.G.; Nagel, R.I.; Beckers, J.F.; Roberts, R.M.
CORPORATE SOURCE: University of Missouri, Columbia, MO.
AVAILABILITY: DNAL (QL876.B5)
SOURCE: Biology of reproduction, Dec 1994. Vol. 51, No. 6. p. 1145-1153
Publisher: Madison : Society for the Study of Reproduction.
CODEN: BIREBV; ISSN: 0006-3363
NOTE: Includes references
PUB. COUNTRY: United States; Wisconsin
DOCUMENT TYPE: Article
FILE SEGMENT: U.S. Imprints not USDA, Experiment or Extension
LANGUAGE: English

AB The **pregnancy-associated glycoproteins** (**PAG** 1) that appear in the maternal serum of cattle and sheep soon after implantation are apparently inactive members of the aspartic proteinase family. Here we describe the isolation of a highly abundant cDNA (**PAG** 2 cDNA) that represents a second member of this gene family which is structurally related to **bovine PAG** 1,

ovine **PAG** 1, and pepsin (58%, 58%, and 51% amino acid sequence identity, respectively). The **bovine PAG** 2 cDNA was identified in two ways. First, the **bovine** placental library was screened under relatively nonstringent conditions with an ovine **PAG** 1 cDNA. The second fortuitous approach employed immunoscreening with an antiserum raised against a partially purified factor that competed with **bovine** LH for binding to the LH receptor on the CL, of the ovary. The full-length cDNA (1258 bp) codes for a polypeptide of 376 amino acids. **Bovine PAG** 2, unlike **bovine PAG** 1, has a catalytic center with a consensus sequence of amino acids. Its mRNA is expressed in fetal placenta but not in other fetal organs, and is localized to both the mononucleate and binucleate cells of the trophectoderm, whereas **PAG** 1 is expressed only in binucleate cells. **PAG** 2 is synthesized by placental explants as a 70-kDa glycoprotein that is processed to several smaller molecules. Western blot analysis of culture media developed with epitope-selected antibodies to **PAG** 2 reveals several bands ranging in apparent Mr from 31 000-70 000, which correspond in size to the polypeptides present in the preparation used for immunization. The function of **PAG** 2 remains unclear, but it could represent one of the poorly characterized gonadotropin-like factors described in placental extracts of cattle and sheep.

L78 ANSWER 33 OF 38 AGRICOLA

ACCESSION NUMBER: 94:85564 AGRICOLA
DOCUMENT NUMBER: IND20430761
TITLE: Plasmatic profiles of pregnancy-associated glycoprotein and progesterone levels during gestation in Churra and Merino sheep.
AUTHOR(S): Ranilla, M.J.; Sulon, J.; Carro, M.D.; Mantecon, A.R.; Beckers, J.F.
AVAILABILITY: DNAL (QP251.A1T5)
SOURCE: Theriogenology, Aug 1994. Vol. 42, No. 3. p. 537-545
Publisher: Newton, Mass. : Butterworth-Heinemann.
CODEN: THGNBO; ISSN: 0093-691X
NOTE: Includes references
PUB. COUNTRY: Massachusetts; United States
DOCUMENT TYPE: Article
FILE SEGMENT: U.S. Imprints not USDA, Experiment or Extension
LANGUAGE: English

AB This study was carried out to determine ovine **pregnancy-associated glycoprotein** (oPAG) and progesterone (P4) levels in the serum of Churra and Merino ewes throughout gestation and the first month post partum. The oPAG levels were determined with an heterologous RIA using **bovine PAG** as standard and tracer and rabbit antiserum against oPAG; sensitivity was 4.0 ng/ml. The P4 levels were measured with a radioimmunological procedure, including a specific extraction step with petroleum ether (bp 60-80 degrees C) with a sensitivity of less than 0.1 ng/ml. There were no differences ($P < 0.10$) in the oPAG profile between breeds from Weeks 1 to 18. From Week 18 to lambing, oPAG concentrations increased rapidly in Churra ewes (on average, from 250 to 650 ng/ml) while remaining relatively constant in the Merino ewes (around 250 ng/ml). No significant differences ($P > 0.05$) were observed for mean weekly P4 levels between the 2 breeds. In both breeds, P4 increased throughout the whole length of gestation, with the highest level measured at Weeks 19-20, then declined 2 wk before parturition. No correlation was found between P4 and oPAG concentrations during gestation in either of the breeds. After lambing, oPAG and P4 levels decreased rapidly in 4 wk to basal values. In both breeds the oPAG concentrations at Weeks 19, 20 and 21 of gestation in ewes carrying male fetuses were higher than in those carrying female fetuses. From the results, we conclude that

the breed and sex of the fetus could influence the production of oPAG.

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ACCESSION NUMBER: 94:34442 AGRICOLA
DOCUMENT NUMBER: IND20389868
TITLE: Characterization of placentation-specific binucleate cell glycoproteins possessing a novel carbohydrate: Evidence for a new family of pregnancy-associated molecules.
AUTHOR(S): Atkinson, Y.H.; Gogolin-Ewens, K.J.; Hounsell, E.F.; Davies, M.J.; Brandon, M.R.; Seamark, R.F.
AVAILABILITY: DNAL (381 J824)
SOURCE: The Journal of biological chemistry, Dec 15, 1993. Vol. 268, No. 35. p. 26679-26685
Publisher: Baltimore, Md. : American Society for Biochemistry and Molecular Biology.
CODEN: JBCHA3; ISSN: 0021-9258
NOTE: Includes references
PUB. COUNTRY: Maryland; United States
DOCUMENT TYPE: Article
FILE SEGMENT: U.S. Imprints not USDA, Experiment or Extension
LANGUAGE: English

AB The ovine binucleate cell-specific glycoproteins recognized by the monoclonal antibody SBU-3 first appear at the initiation of placentation, and their expression continues throughout gestation. These placenta-specific proteins have not been detected in any other adult or fetal sheep tissues and are specific to the materno-fetal interface. The SBU-3 monoclonal antibody recognizes the carbohydrate epitope common to a group of proteins ranging in molecular mass from 30 to 200 kDa whose function during **pregnancy** remains undefined. The biochemical properties of these uniquely expressed glycoproteins were investigated by analyzing both the carbohydrate and protein portion of the molecules. Analysis of phytohemagglutinin and concanavalin A binding to electrophoretically separated SBU-3 proteins revealed that the major proteins between 40 and 70 kDa bind phytohemagglutinin. In contrast, concanavalin A bound only to minor proteins in the SBU-3 glycoprotein preparation. Analysis of the carbohydrate conjugated to the SBU-3 glycoproteins revealed that the major chains are sialylated O-linked and complex partially sialylated multiple antennary N-linked chains. The presence of N- glycolylneuraminic acid in an N-linked structure indicates the unique nature of this carbohydrate epitope. The differential binding to phytohemagglutinin and concanavalin A provided a method for further purification and characterization of the major protein components with monoclonal antibody immunoaffinity-purified SBU-3 proteins being further separated by concanavalin A-Sepharose chromatography. Microsequence analysis of the major non-concanavalin A-binding proteins (69, 62, and 57 kDa) revealed partial homology to ovine and **bovine pregnancy-associated glycoprotein** and rabbit pepsinogen F. Immunoblot analysis of the SBU-3 proteins showed cross-reactivity with polyclonal antisera directed against ovine placental-associated glycoprotein and **pregnancy**-specific glycoprotein B. These results suggest that together these glycoproteins represent members of a binucleate cell-derived family of **pregnancy**-associated molecules in the ruminant placenta.

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ACCESSION NUMBER: 92:83689 AGRICOLA
DOCUMENT NUMBER: IND92049046

TITLE: Light and electron microscopic immunolocalization of **bovine pregnancy-associated glycoprotein** in the **bovine** placentome.
AUTHOR(S): Zoli, A.P.; Demez, P.; Beckers, J.F.; Reznik, M.; Beckers, A.
CORPORATE SOURCE: Universite de l'Etat a Liege, Liege, Belgique
AVAILABILITY: DNAL (QL876.B5)
SOURCE: Biology of reproduction, Apr 1992. Vol. 46, No. 4. p. 623-629
Publisher: Champaign, Ill. : Society for the Study of Reproduction.
CODEN: BIREBV; ISSN: 0006-3363
NOTE: Includes references.
DOCUMENT TYPE: Article
FILE SEGMENT: U.S. Imprints not USDA, Experiment or Extension
LANGUAGE: English

AB A **bovine pregnancy-associated glycoprotein** (bPAG) of 67 kDa has previously been isolated from **bovine** fetal cotyledons. The objective of this study was to determine the cytological localization of that protein in the placentomes and possibly the cells responsible for its production. Highly specific antisera raised against pure bPAG were used to demonstrate the cellular localization of the protein in **bovine** placentomes by light and electron microscopic techniques. Strong immunostaining was observed exclusively in the cytoplasm of large binucleate cells present predominantly in fetal cotyledonary tissue (villi). Some smaller weakly immunostained cells were also present in caruncular epithelium. By ultrastructural immunogold procedures, the protein was detected only within amorphous cytoplasmic granules. Granules of identical size, but weakly labeled, were found on the maternal side. All cells containing labeled granules were binucleate. These results suggest that bPAG is probably synthesized by trophoblast binucleate cells and stored in granules prior to delivery into the maternal circulation after cell migration.

L78 ANSWER 36 OF 38 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved. (2004) on STN DUPLICATE 27
ACCESSION NUMBER: 92:73637 AGRICOLA
DOCUMENT NUMBER: IND92041767
TITLE: Radioimmunoassay of a **bovine pregnancy-associated glycoprotein** in serum: its application for **pregnancy** diagnosis.
AUTHOR(S): Zoli, A.P.; Guilbault, L.A.; Delahaut, P.; Ortiz, W.B.; Beckers, J.F.
CORPORATE SOURCE: Universite de l'Etat a Liege, Belgique
AVAILABILITY: DNAL (QL876.B5)
SOURCE: Biology of reproduction, Jan 1992. Vol. 46, No. 1. p. 83-92
Publisher: Champaign, Ill. : Society for the Study of Reproduction.
CODEN: BIREBV; ISSN: 0006-3363
NOTE: Includes references.
DOCUMENT TYPE: Article
FILE SEGMENT: U.S. Imprints not USDA, Experiment or Extension
LANGUAGE: English

AB A sensitive and specific double-antibody RIA for a **bovine pregnancy-associated glycoprotein** (bPAG) is described. The limit of detection was 0.2 ng/ml. The assay was specific for bPAG in that pituitary and placental gonadotropic hormones and other placental or serum proteins assayed in serial dilutions did not

cross-react. The RIA allowed measurement of bPAG in placental extracts, fetal serum, fetal fluids, and serum or plasma of **pregnant** cows. About 20% of unbred heifers and nonpregnant cows had detectable levels ranging from 0.30 +/- 0.09 to 0.50 +/- 0.17 ng/ml (mean +/- SD), and 15% of bull sera showed higher concentrations (3.01 +/- 1.73 ng/ml) of bPAG or bPAG-like protein. Variations among animals was observed in fetal serum bPAG concentrations. **Bovine PAG** was detected in maternal peripheral blood at Day 22 of **pregnancy** (mean +/- SD, 0.38 +/- 0.13 ng/ml) in some animals and at Day 30 in all **pregnant** cows. Peripheral serum bPAG levels increased progressively to 3.60 +/- 1.73 ng/ml (mean +/- SD) at Day 30 of **pregnancy**, to 24.53 +/- 8.81 ng/ml at Day 120, and to 1551.91 +/- 589.68 ng/ml at Day 270. Peak concentration of bPAG was 2462.42 +/- 1017.88 ng/ml and it occurred 1-5 days prior to parturition. After delivery, bPAG concentrations decreased steadily to 499.63 +/- 267.20 ng/ml at Day 14 postpartum (pp), 10.12 +/- 7.84 ng/ml at Day 60 pp, and 1.44 +/- 1.08 ng/ml at Day 90 pp. The undetectable concentration (<0.20 ng/ml) was reached by Day 100 +/- 20 pp. An investigation undertaken in Holstein heifers, Holstein cows, and Hereford cows used as recipients for purebred Holstein embryos supplied evidence of the influence of breed of recipient and sex of fetuses on peripheral concentrations of bPAG. A herd of 430 Holstein-Friesian heifers that had received transferred embryos were bled at Day 35 postestrus (pe) for measurement of bPAG. The bPAG was detected in 287 of 430 scrum samples analyzed. By rectal palpation performed at Day 45 pe, 267 heifers with detectable levels of bPAG at Day 35 pe were confirmed to be **pregnant** as were 3 of 143 heifers previously, diagnosed as not **pregnant** by RIA. These results suggest that detection of this placental-specific antigen in the serum could be used as a specific serological method for early **pregnancy** diagnosis in cattle from 28 days after breeding.

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ACCESSION NUMBER: 92:23633 AGRICOLA
DOCUMENT NUMBER: IND92006483
TITLE: Purification and characterization of a **bovine pregnancy-associated glycoprotein**.
AUTHOR(S): Zoli, A.P.; Beckers, J.F.; Wouters-Ballman, P.; Closset, J.; Falmagne, P.; Ectors, F.
CORPORATE SOURCE: Faculte de Medecine Veterinaire, Bruxelles, Belgique
AVAILABILITY: DNAL (QL876.B5)
SOURCE: Biology of reproduction, July 1991. Vol. 45, No. 1. p. 1-10
Publisher: Champaign, Ill. : Society for the Study of Reproduction.
CODEN: BIREBV; ISSN: 0006-3363
NOTE: Includes references.
DOCUMENT TYPE: Article
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AB A 67 000 Mr **bovine pregnancy-associated glycoprotein** (bPAG) has been isolated from fetal cotyledons and purified to homogeneity by HPLC. The purification was monitored by a double immunodiffusion test and by RIA in conjunction with an antiserum raised against a crude fraction of placenta-specific antigens. The molecular weight of bPAG was estimated to be 67 000 by SDS-PAGE. The isoelectric points (pI) of the four isoforms, determined by high-resolution analytical electrofocusing in polyacrylamide gel, were 4.4, 4.6, 5.2, and 5.4. The carbohydrate content of the bPAG consisted of approximately 10.02 +/- 1.09% neutral sugar and variant amounts of sialic acid (from 0.29 +/- 0.06% in the most basic isoform to 2.1 +/- 0.31% in

the most acidic isoform). A specific antiserum was raised against the purified bPAG. A specific RIA showed that the bPAG was antigenically unrelated to BSA, alphafetoprotein (AFP), and human schwangerschaft-spezifischen (**pregnancy**-specific) beta 1 glycoprotein (SP1). According to some characteristics (e.g. the molecular weight), the purified bPAG may correspond to a form of the **pregnancy**-specific protein B previously described by Sasser and colleagues (Biol Reprod 1986; 35:936-942).

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TITLE:	Glycan structure of **bovine pregnancy-associated glycoproteins**
AUTHOR:	Hashizume, K.; Patel, O.V.; Takahashi, T.; Yonezawa, N.; Katsumata, T.; Imai, K.; Nakano, M.
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L Number	Hits	Search Text	DB	Time stamp
1	0	pregan$4 same bovine same antigen	USPAT; EPO	2004/05/11 09:34
2	55	pregna$4 same bovine same antigen	USPAT; US-PGPUB; EPO; DERWENT	2004/05/11 09:34
3	2	(pregna$4 same bovine same antigen) same PAG	USPAT; US-PGPUB; EPO; DERWENT	2004/05/11 09:44
4	7070	(435/287.2,7.1,70.21,335).CCLS.	USPAT; EPO	2004/05/11 09:49
5	349	(530/388.23).CCLS.	USPAT; EPO	2004/05/11 09:49
6	0	("14and12").PN.	USPAT; EPO	2004/05/11 09:49
7	0	("14and12").PN.	USPAT; EPO	2004/05/11 09:49
8	0	("15and12").PN.	USPAT; EPO	2004/05/11 09:49